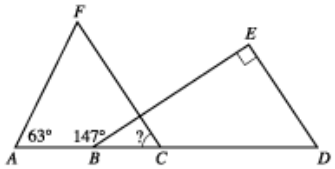
SAMPLE MATHEMATICS TEST QUESTIONS

DIRECTIONS

Click on the letter choices to determine if you have the correct answer and for question explanations.
An actual ACT Mathematics Test contains 60 questions to be answered in 60 minutes.

Set 4

1. In the figure below, A, B, C, and D are collinear, $\overline{FC}$ is parallel to $\overline{ED}$, $\overline{BE}$ is perpendicular to $\overline{ED}$, and the measures of $\angle FAB$ and $\angle EBA$ are as marked. What is the measure of $\angle FCB$?



A. 33°

B. 57°

C. 63°

D. 84°

E. Cannot be determined from the given information

2. Which of the following is an equation of the circle with its center at (0,0) that passes through (3,4) in the standard (x,y) coordinate plane?

F. $x - y = 1$

G. $x + y = 25$

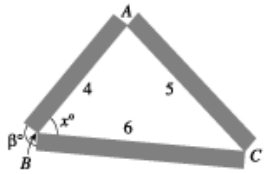
H. $x^2 + y = 25$

J. $x^2 + y^2 = 5$

K. $x^2 + y^2 = 25$

Use the following information to answer questions 3–5.

Taher has decided to create a triangular flower bed border. He plans to use 3 pieces of rectangular lumber with lengths 4, 5, and 6 feet, as shown in the figure below. Points A, B, and C are located at the corners of the flower bed.



3. Taher plans to cut the 3 pieces of lumber for the flower bed border from a single piece of lumber. Each cut takes $\frac{1}{8}$ inch of wood off the length of the piece of lumber. Among the following lengths, in inches, of pieces of lumber, which is the shortest piece that he can use to cut the pieces for the flower bed border?

A. 178

B. 179

C. 180

D. 181

E. 182

4. The measure of $\angle ABC$ in the figure is $x°$. Which of the following is an expression for $\beta°$?

F. $x°$

G. $2x°$

H. $(90 + x)°$

J. $(180 - x)°$

K. $(180 - \frac{x}{2})°$

5. After arranging the flower bed, Taher decides that the flower bed would look more attractive if 1 of the angles in the triangle were a right angle. He decides to place the right angle at vertex A and to leave the lengths of $\overline{AB}$ and $\overline{AC}$ as 4 and 5 feet, respectively. To the nearest 0.1 foot, how long of a piece of lumber would he need to replace the 6-foot piece represented by $\overline{BC}$?

A. 3.0

B. 3.3

C. 6.0

D. 6.4

E. 7.8

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6. Which one of the following expressions has an even integer

value for all integers a and c ?

F. $8a + 2ac$

G. $3a + 3c$

H. $2a + c$

J. $a + 2c$

K. $ac + a^2$

7. A neighborhood recreation program serves a total of 280 children who are either 11 years old or 12 years old. The sum of the children's ages is 3,238 years. How many 11-year-old children does the recreation program serve?

A. 55

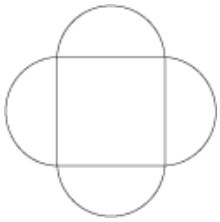
B. 122

C. 132

D. 158

E. 208

8. The geometric figure shown below consists of a square and 4 semicircles. The diameters of the semicircles are the sides of the square, and each diameter is 10 centimeters long. Which of the following is the closest approximation of the total area, in square centimeters, of this geometric figure?



F. 100

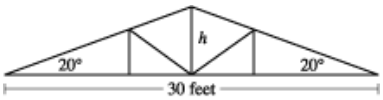
G. 160

H. 260

J. 400

K. 730

9. Which of the following expressions is the closest approximation to the height h, in feet, of the roof truss shown below?



A. 15 tan 20°

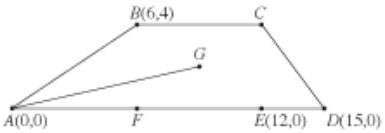
B. 15 sin 20°

C. 30 tan 20°

D. 30 sin 20°

E. $\frac{15}{\sin 20°}$

10. Quadrilateral $ABCD$ is drawn on the standard (x,y) coordinate plane as shown below, with points E and F on $\overline{AD}$. Point G is the center of rectangle $BCEF$. How many coordinate units long is $\overline{AG}$?



F. $\sqrt{10}$

G. $\sqrt{13}$

H. $\sqrt{85}$

J. $\sqrt{97}$

K. 11

11. What is the x-intercept of the graph of $y = x^2 - 4x + 4$?

A. –2

B. –1

C. 0

D. 1

E. 2

12. For all nonzero real numbers p, t, x, and y such that $\frac{x}{y} = \frac{3p}{2t}$, which of the following expressions is equivalent to t ?

F. $\frac{y}{2}$

G. $\frac{3px}{2y}$

H. $\frac{6py}{x}$

J. $\frac{3py}{x}$

K. $\frac{3py}{2x}$

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